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## Status Report NAGW-4853, Discover Earth September 22, 1997

### Introduction

Discover Earth is a NASA-funded project for teachers of grades 5-12 who want to expand their knowledge of the Earth system, and prepare to become master teachers who promote Earth system science in their own schools, counties, and throughout their state. Participants from the following states are invited to apply: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Washington, DC. Teachers selected for the project participate in a two-week summer workshop conducted at the University of Maryland, College Park; develop classroom-ready materials during the workshop for broad dissemination; conduct a minimum of two peer training activities during the coming school year; and participate in other enrichment/education opportunities as available and desired. Discover Earth is a team effort that utilizes expertise from a range of contributors, and balances science content with hands-on classroom applications.

### Planning

To ensure that Discover Earth plans for the summer workshop were effective and appropriately focused, the project conducted a one-day Definition Workshop at the University of Maryland, College Park, on February 21, 1997. Participants included the Discover Earth team (Ms. Colleen Steele, Project Manager, IGES; Dr. Eric Barron, Director, Earth System Science Center, The Pennsylvania State University; Dr. Robert Hudson, Chairman, Department of Meteorology, University of Maryland, College Park; and Ms. Claudia Dauksys, Administrative Support, IGES); one classroom teacher who participated in the 1996 workshop; five classroom teachers with a range of expertise such as serving as a NASA Teacher on Loan or science department chair; and one NASA representative and two University of Maryland faculty members who would be presenting at the workshop. This session was used to review the workshop goals and the draft course outline developed by Ms. Steele, review the workshop assessment completed by the previous summer's participants, consider ways to enhance the application of the science content in the classroom, and enhance relevance to National Science Education Standards.

### Application and Selection Process

The Discover Earth project announcement and application are disseminated electronically (NASA Spacelink, Goddard Space Flight Center homepage, Earth System Science Education Notes, EarthRise homepage, and via e-mail) and in hard copy (approximately four thousand copies of the announcement brochure were distributed via science teacher organizations and state education heirarchies). The workshop announcement (attachment A) and application (attachment B) are intended to entice teachers with a range of experience, expertise, and time in profession. In order to address the full spectrum of teacher needs, computer skills are not a selection criteria. Fifteen teachers were selected for participation in the 1997 workshop, highlights of their interests and accomplishments are listed in attachment C. Two additional participants, both NASA Aerospace Education Specialists (NAES), were selected by that program to participate, at the invitation of the Discover Earth project. The list of workshop participants is attachment D.

## Summer Workshop

The Discover Earth summer workshops (1996-1998) focus on science content (the seven key issues of global climate change) and enhancing Earth system science teaching (through new resources, development of classroom-ready materials, sharing of peer ideas and strategies, and introducing relevant technology/software). Content emphasis for 1997 was on:

- an overview of the Earth system;
- land surface; ecosystems and hydrology
- volcanoes and climate change
- sources of information; and
- student investigations/classroom activities.

The workshop agenda is attachment E.

Science content instructors were Dr. Eric Barron (Penn State), Dr. Soroosh Sorooshian (U. of Arizona), Dr. Alan Robock (U of MD-CP), and Dr. Satya Kalluri (U of MD-CP). Dr. Robert Hudson served as academic host and scientific and technical resource. Ms. Colleen Steele guided classroom applications and development of educational materials. Ms. Stephanie Stockman presented an overview of Mission to Planet Earth and relevant NASA Internet sites.

Participants received project and logistic information prior to the workshop. Logistics support included hotel accommodations, breakfast and lunch, per diem money for dinner expenses, travel cost, all materials for the course, and \$500 honorarium upon successful completion. Course materials were provide by Discover Earth for the NAES, but the balance of their expenses was paid for by that project. Project administration was conducted by Ms. Colleen Steele, IGES, with logistical support provided by Ms. Claudia Dauksys, IGES.

Workshop participants were divided (by the grade levels they teach) into five groups to develop classroom-ready materials. The lessons were then edited by Ms. Steele to ensure they were complete, understandable, contained adequate background information, and were supplemented with graphic materials as appropriate. All the lessons include Internet options but do not require them for utilization. The materials developed during the 1997 workshop have been prepared for distribution and are currently being reviewed by the teachers. When the teachers finalize the materials at the end of this month, the materials will be disseminated to participants and requesters (we have compiled & updated a database since project inception), and will be available via Internet (including NASA Spacelink, EarthRise, GSFC homepage, etc.)

Classroom materials developed by the participants include background information and are accompanied by NASA Facts, when appropriate, to familiarize teachers with key issues of climate change and enable them to introduce these topics in their classrooms. The classroom materials developed during the 1996 workshop are enclosed (attachment F).

## **Assessment**

Participants completed a content assessment test on the first day of the course to identify their levels of knowledge, which guided the instructors in utilizing the available time. Participants completed a course evaluation at the end of day nine (the summary of their responses is attachment G). Their comments will guide continued operation of the project and planning for the 1998 workshop

## **Outreach**

A variety of activities are planned or begun to ensure that the largest possible audience is aware of the project, utilizing the classroom materials, applies to participate, and taps other NASA education resources. All of the participants are responsible for conducting outreach activities. Many of the participants present sessions at their state level science education conferences, which is particularly effective for promoting awareness of these efforts. Project Manager, Colleen Steele, with Dr. Blanche Meeson of the GSFC DAAC and four teachers presented a Discover Earth session at the 1997 NSTA National Convention. Ms. Steele is scheduled to conduct a session at the 1998 Convention. In both cases, a workshop format is/will be used to enable a hands-on approach to the materials.

Ms. Steele presented the Discover Earth project at the 1997 American Meteorological Society's annual convention, education seminar. The project has also distributed information to targeted-states' science coordinators, education newsletters, and local science teacher conferences.

## **Upcoming Activities**

Immediate priorities are finalization and distribution of the 1997 classroom-ready materials, and the announcement and planning for the 1998 workshop.